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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,244	12/03/2001	Dieter Klaus Weller	010949	7904

23464 7590 05/06/2004

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EXAMINER

BERNATZ, KEVIN M

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/005,244

Applicant(s)

WELLER ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-32 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 and 20-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 13-19 and 27-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

1. Addition of new claims 27 - 32, filed on February 20, 2004, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comments

3. Regarding the limitation(s) "having a locking pattern formed therein; and nanoparticles completely filling the locking pattern" in claims 13 and 27, the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111. Specifically, the Examiner has interpreted the above limitation to read on any patterned-type structure wherein nanoparticles are separated from each other since applicants' have not explicitly defined the term and have only given examples of what qualifies as a "locking pattern", including examples requiring no physical modification of the substrate surface. As such, any physio-chemical interactions which produce dispersed patterns of nanoparticles are deemed to read on "locking pattern".

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4. Regarding the limitation(s) “exhibiting short-range order characteristics” in claims 13 and 27 and “self-assembly-coherence length scale” in claims 18 and 32, the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants’ specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111. Specifically, the Examiner notes that “short-range order” has been interpreted to read on any degree of ordering other than a randomly disordered structure. The “self-assembly-coherence-length-scale” has been interpreted to refer to the length at which the nearest neighbor distance between any two adjacent neighbors is approximately constant (i.e. the degree of coherence of the nanoparticles) regardless of the method by which the coherence is formed (see *applicants’ specification, pages 3 – 4 and pages 9 – 10*). Applicants are reminded that the method by which the a product is formed (i.e. self assembly) is not germane to the determination of patentability of a product baring a showing of an unexpected improvement when using the claimed method.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 13 – 19 and 27 – 32 are rejected under 35 U.S.C. 102(a) and/or 102(e) as being anticipated by Kikitsu et al. (U.S. Patent No. 6,602,620).

Regarding claims 13 and 27, Kikitsu et al. disclose a magnetic recording disk, i.e. “data storage medium” for magnetic recording (*Title*) comprising a disk substrate having a locking pattern formed therein (*col. 6, lines 21 – 30; col. 10, lines 52 – 55; and examples*), and nanoparticles completely filling the locking pattern (*Figure 13B, element 32 and Table 1*) and exhibiting short-range order (*Figures 4, 5 and 13A and 13B*).

Regarding claims 14, 17, 28 and 31, Kikitsu et al. disclose nanoparticles and “pit depths” meeting applicants’ claimed limitations (*Figures 13 - 15; col. 25, lines 1 – 20; and Table 1*).

Regarding claims 15, 16, 29 and 30, Kikitsu et al. disclose nanoparticles and substrate materials meeting applicants’ claimed limitations (*col. 25, lines 26 – 38; col. 31, lines 48 – 67; and examples*).

Regarding claims 18 and 32, Kikitsu et al. disclose a coherence length scale meeting applicants' claimed limitations (*Figures 28 and 29*).

Regarding claim 19, Kikitsu et al. disclose a protective layer meeting applicants' claimed structural limitations (*examples*).

7. Claims 13 – 16, 18, 19, 27 - 30 and 32 are rejected under 35 U.S.C. 102(a) and/or 102(e) as being anticipated by Black et al. (U.S. Patent No. 6,162,532).

Regarding claims 13 and 27, Black et al. disclose a magnetic recording disk, i.e. "data storage medium" for magnetic recording (*Title*) comprising a disk substrate having a locking pattern formed therein (*col. 3, lines 25 - 30; and examples*), and nanoparticles completely filling the locking pattern (*Title; Figures and col. 4, lines 61 - 63*) and exhibiting short-range order (*Figures*).

Regarding claims 14 and 28, Black et al. disclose nanoparticles meeting applicants' claimed limitations (*col. 4, lines 61 - 63*).

Regarding claims 15, 16, 29 and 30, Black et al. disclose nanoparticles and substrate materials meeting applicants' claimed limitations (*col. 5, lines 21 - 41 and examples*).

Regarding claims 18 and 32, Black et al. disclose a coherence length scale meeting applicants' claimed limitations (*Figures 1 and 3, where B is taught to be ~12 nm in one embodiment – col. 6, lines 62 – 67*).

Regarding claim 19, Black et al. disclose a protective layer meeting applicants' claimed structural limitations (*col. 6, lines 41 - 60*).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 17, 18, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Black et al. as applied above, and further in view of Kikitsu et al. ('620 B1).

Black et al. is relied upon as described above.

Regarding claims 17 and 31, Black et al. fail to disclose a pit depth of 5 – 20 nm.

However, Kikitsu et al. teach that a method of forming a patterned array of magnetic particles for a magnetic recording medium can utilize magnetic particles filling non-magnetic pores, wherein the pores are taught to possess a depth meeting applicants' claimed range in order to produce a highly uniform, high density patterned media (*Figures 13 - 15; col. 25, lines 1 – 20; and Table 1*)

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Black et al. to use a pit depth meeting applicants' claimed limitation as taught by Kikitsu et al. since a pore with such a depth can be used to produce a highly uniform, high density patterned media.

Regarding claims 18 and 32, even in the event that one of ordinary skill in the art would not have readily envisioned a coherence length scale meeting applicants' claimed

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limitation based on the Black et al. teachings, the Examiner deems that such a limitations would have been obvious to one of ordinary skill in the art. Specifically, Kikitsu et al. provides a teaching that such a coherence length scale (*Figures 28 and 29*) can be used to obtain a high areal recording density patterned media.

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Black et al. to use a coherence length scale meeting applicants' claimed range as taught by Kikitsu et al., since such a length scale can be used to obtain a high areal recording density for a patterned media..

Response to Arguments

10. The rejection of claims 13 - 19 under 35 U.S.C § 102(b) - Misewich

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (571) 272-1516. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin M. Bernatz
Patent Examiner

April 30, 2004